

What is Claimed:

- 1        1. An apparatus for use in a cephalostat comprising:
  - 2            a collimator for defining the shape of an X-ray beam;
  - 3            a soft tissue filter screen for attenuating a portion of the X-ray beam,
  - 4        wherein the soft tissue filter screen comprises:
    - 5            a)        an anterior facial portion having a leading edge, wherein  
6        the leading edge is located at the most posterior position of the anterior facial  
7        portion, and
    - 8            b)        a submental-neck portion coupled to the anterior facial  
9        portion and having a leading edge at a position posterior relative to the leading edge  
10      of the anterior facial portion,
  - 11        wherein the soft tissue filter screen is independently adjustable relative  
12      to the collimator.
- 1        2. An apparatus according to claim 1, wherein the soft tissue filter  
2        screen is L-shaped having a first leg and a second leg disposed perpendicular to one  
3        another, wherein the anterior facial portion is the first leg and the submental-neck  
4        portion is the second leg.

1           3. An apparatus according to claim 1, wherein the soft tissue filter  
2   screen is adjustable relative to the collimator in the anterior/posterior direction.

1           4. An apparatus according to claim 1, wherein the soft tissue filter  
2   screen is adjustable relative to the collimator in the superior/inferior direction.

1           5. An apparatus according to claim 1, wherein the anterior facial  
2   portion and the submental-neck portion comprise a unitary component.

1           6. An apparatus according to claim 1, wherein the leading edge of the  
2   anterior facial portion and the leading edge of the submental-neck portion are  
3   beveled.

1           7. An apparatus according to claim 1, wherein the anterior facial  
2   portion and the submental-neck portion are modular.

1           8. An apparatus according to claim 7, wherein the submental-neck  
2   portion is adjustable relative to the anterior facial portion in the anterior/posterior  
3   direction.

1           9. An apparatus according to claim 7, wherein the anterior facial  
2   portion and the submental-neck portion are connected to one another along mated  
3   beveled edges.

1           10. An apparatus according to claim 1, wherein the submental-neck  
2   portion is adapted to enhance radiograph images of the neck contour of a patient.

1           11. An apparatus according to claim 1, wherein the soft tissue filter  
2   screen is copper.

1           12. An apparatus according to claim 1, wherein the collimator  
2   comprises four plates defining an opening to define the X-ray beam, wherein the  
3   plates are independently adjustable relative to one another towards and away from  
4   the center of the opening.

1           13. An apparatus according to claim 1, wherein the collimator  
2   comprises a single frame defining an opening to define the X-ray beam.

1           14. A cephalometric radiology apparatus comprising  
2           a support structure;  
3           an X-ray source supported by the support structure for emitting X-  
4   rays;

5           a collimator supported by the support structure and positioned along  
6   the path of the X-rays for defining an X-ray beam emitted from the X-ray source;

7           a soft tissue filter screen for attenuating a portion of the X-ray beam  
8   and mounted independently of the collimator, wherein the soft tissue filter screen  
9   comprises:

10                           a)       an anterior facial portion having a leading edge, wherein  
11       the leading edge is located at the most posterior position of the anterior facial  
12       portion, and

13                           b)       a submental-neck portion coupled to the anterior facial  
14       portion and having a leading edge at a position posterior relative to the leading edge  
15       of the anterior facial portion,

16                           wherein the soft tissue filter screen is independently adjustable relative  
17       to the collimator; and

18                           an X-ray detector to collect X-rays emitted from the X-ray source.

1                           15. An apparatus according to claim 14 further comprising at least  
2       one positioning light to identify an optimum position of the soft tissue filter relative  
3       to the head of the patient, wherein said positioning light emits a signal  
4       representative of the optimum position, and a controller responsive to the signal for  
5       moving the soft tissue filter screen to the optimum position.

1                           16. An apparatus according to claim 15, wherein the anterior facial  
2       portion and the submental-neck portion are modular and adjustable relative to one  
3       another, and the signal identifies a first data point corresponding to the optimum  
4       position for the leading edge of the anterior facial portion, a second data point  
5       corresponding to the optimum position for the leading edge of the submental-neck  
6       portion, and a third data point corresponding to the optimum position for intersection  
7       of the anterior facial portion and the submental-neck portion.

1           17. An apparatus according to claim 15, wherein the at least one  
2 positioning light positions the soft tissue filter screen in at least one of the  
3 anterior/posterior direction and the superior/inferior direction.

1           18. An apparatus according to claim 14, wherein the soft tissue filter  
2 screen is mounted between the collimator and the X-ray source.

1           19. An apparatus according to claim 14, wherein the collimator is  
2 mounted between the soft tissue filter screen and the X-ray detector.

1           20. A method for imaging soft tissue and hard tissue congruently on  
2 the same radiograph comprising the steps of:

3           emitting X-rays from an X-ray source;

4           positioning a collimator across the X-rays to define an X-ray beam;

5           positioning a soft tissue filter screen across the X-ray beam  
6 independently of the step of positioning the collimator, to attenuate the X-rays  
7 passing through a portion of the forehead, nose, lips, chin and neck of a patient,  
8 wherein the soft tissue filter screen comprises:

9           a)       an anterior facial portion having a leading edge, wherein  
10          the leading edge is located at the most posterior position of the anterior facial  
11          portion, and

12                           b)     a submental-neck portion coupled to the anterior facial  
13     portion and having a leading edge at a position posterior relative to the leading edge  
14     of the anterior facial portion; and  
  
15                           collecting the X-rays on a radiograph.

1                           21. A modular soft tissue filter screen system for use with a  
2     cephalostat having a collimator for defining an X-ray beam, which system comprises:

3                           a soft tissue filter screen for attenuating a portion of the X-ray beam,  
4     wherein the soft tissue filter screen comprises:

5                           a)     an anterior facial portion having a leading edge, wherein  
6     the leading edge is located at the most posterior position of the anterior facial  
7     portion, and

8                           b)     a submental-neck portion coupled to the anterior facial  
9     portion and having a leading edge at a position posterior relative to the leading edge  
10    of the anterior facial portion, and

11                          a mounting component supporting the soft tissue filter screen and  
12     adapted to be attached to the cephalostat at a position such that the soft tissue filter  
13     screen is aligned within the X-ray beam.

1                           22. A system according to claim 21, wherein the soft tissue filter  
2     screen is L-shaped having a first leg and a second leg disposed perpendicular to one

3 another, wherein the anterior facial portion is the first leg and the submental-neck  
4 portion is the second leg.

1           23. A system according to claim 21, wherein the soft tissue filter  
2 screen is adjustable in the anterior/posterior direction relative to the collimator.

1           24. A system according to claim 21, wherein the anterior facial portion  
2 and the submental-neck portion are modular.

1           25. A system according to claim 24, wherein the submental-neck  
2 portion is adjustable relative to the anterior facial portion in the anterior/posterior  
3 direction.

1           26. A system according to claim 24, wherein the anterior facial portion  
2 and the submental-neck portion are connected to one another along mated beveled  
3 edges.

1           27. A system according to claim 21, wherein the anterior facial portion  
2 and the submental-neck portion comprise a unitary component.

1           28. A system according to claim 21, wherein the leading edge of the  
2 anterior facial portion and the leading edge of the submental-neck portion are  
3 beveled.

1           29. A system according to claim 21, wherein the soft tissue filter  
2 screen is adjustable relative to the collimator in a inferior/superior direction.

1           30. A system according to claim 21, wherein the submental-neck  
2 portion is adapted to enhance radiographic images of the facial soft tissue inferior to  
3 the mandible and the neck contour of a patient

1           31. A system according to claim 21, wherein the soft tissue filter  
2 screen is copper.

1           32. A method according to claim 20 further comprising:

2           identifying an optimum position of the soft tissue filter screen; and  
3           generating a signal representative the optimum position,

4           wherein the step of positioning the soft tissue filter screen comprises  
5 receiving the signal and moving the soft tissue filter screen to the optimum position  
6 by adjusting the soft tissue filter screen in at least one of the anterior/posterior  
7 direction and the superior/inferior direction.

1           33. A method according to claim 32, wherein the anterior facial  
2 portion and the submental-neck portion are modular and adjustable relative to one  
3 another, and the signal identifies a first data point corresponding to the optimum  
4 position for the leading edge of the anterior facial portion, a second data point  
5 corresponding to the optimum position for the leading edge of the submental-neck  
6 portion, and a third data point corresponding to the optimum position for intersection  
7 of the anterior facial portion and the submental-neck portion.

- 1        34. A modular soft tissue filter screen system according to claim 21
- 2        further comprising a housing for the collimator, wherein the mounting component for
- 3        the soft tissue filter screen is adapted to be attached to the housing of the collimator.